

Assessment of Grazing Characteristics and Effects on Livelihoods of Food Crop Farmers in Bui and Donga Mantung, North West Cameroon

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Abstract:- Livestock and crop production are livelihood complementary activities carried out in the grassfield areas of the rural Cameroon. Empirical studies have proven that these two activities have never been in harmony. This along side the grazing systems has had great repercussions on farm parcels and crop yields. Preliminary field visits, Focus Group Discussions (FGDs) with both graziers and crop farmers alongside the administration of 300 semi-structured questionnaires were employed in order to obtain the required data. The results revealed that about 91.6% of the respondents practices extensive grazing system while about 89.7% of crop farmers practice permanent cultivation. Consequently, 88.4% have been victims of crop destruction and with 36.8% with frequency of between 6-10 times. The study also found that crop destruction by cattle has been on the increase as cattle population keeps increasing with increase scarcity in grazing land and fodder. Retreat on farm parcel and a subsequent reduction on household income are the immediate aftermath. However, there is a tendency of reconciliation as graziers have started becoming cautious about the existence of both activities through the formation of alliance farming.

Key words: Bui and Donga Mantung, Grazing systems, Farming systems, Food crop Farmers

I. INTRODUCTION

Globally, Twenty-six per cent of the planet ice free land is use for grazing and thirty-three per cent of croplands are use for livestock feed production. To this, one billion poor people, mostly pastoralists depend on livestock for food and livelihoods [1]. This livestock rearing accounts for 40% of worldwide income from agriculture and the demand today still remain up surge at the detriment of crop land and water [2]. Albeit, this livestock are grazed by over 200 to 500 million people worldwide [3], land competition have remain an issue of major concern and a cause of conflict. This seen especially between pastoral minorities and crop farmers, between pastoralist and nature conservationist as well as the unfair and incomplete implementation of regulations and the increasing shift of pastoral lifestyle to crop farming. Population growth and rising demand for food crops and cash crops have only come to exacerbate the loss of grazing lands [4].

In Africa, livestock rearing and crop farming are the main preoccupation of the rural population. This is the main economic activity of the people. Therefore, communal conflicts have serious implication on food system. Often, warring communities or parties tactically resort to manipulation over access to food and livestock. Not only has these communal conflicts limited production of food, it has the propensity to deny people access to food and availability of food supply too [5]. Rural agrarian societies consequentially, have resort to integrating more or less livestock and rely on several flexible combinations of activities. In the crop and pastoral systems, farming systems oriented towards livestock for milk. Crop productions have become more or less complementary in their land use, creating among all, social relations ranging from complementarity to competition.

In Cameroon, stakeholders have less interest in resolving graziers and crop farmer issues. Disputes have been a common feature in the country. Economic resources generate protracted clashes not only between ethnic groups, villages and individuals, but also over the choices of economic activity. From simple crop damage, the opposition between crop farmers and graziers have been taking many forms, ranging from daily quarrels, frequent exchange of blows, mob demonstrations and litigation, to the use of mystical powers and conventional weapons [6]. To [7] these have an increasing threat on food insecurity, especially in small-scale subsistent families, with small farmholdings. This study seeks to identify the various farming systems, outlines the effects of grazing on food crop production and how it influences the rural economy as well as the way forward in the Bui and Donga Mantung Division.

1.1 Location of the Study area and methods

1.1.1: location of the study area

Bui and Donga Mantung are two out of the seven administrative divisions that make up the North West Region of Cameroon. With particular focus on the Noni, and Kumbo Central (Bui Division), Nkambe Central and Misaje (Donga

Mantung) subdivisions, they are areas located between latitudes 6°15' and 6°48' North of the equator and longitudes 10° 30' and 11° 0' East of the Greenwich meridian (Fig 1). It covers a surface area of about 327.5km² with pockets of concentrated settled agrarian population of about 208552

inhabitants [8]. The study area is part of the Bui plateau and presents a fascinated landscape, which favours cattle rearing alongside food crop production in the pocket of basins such as Misaje, Ako and Nkor.

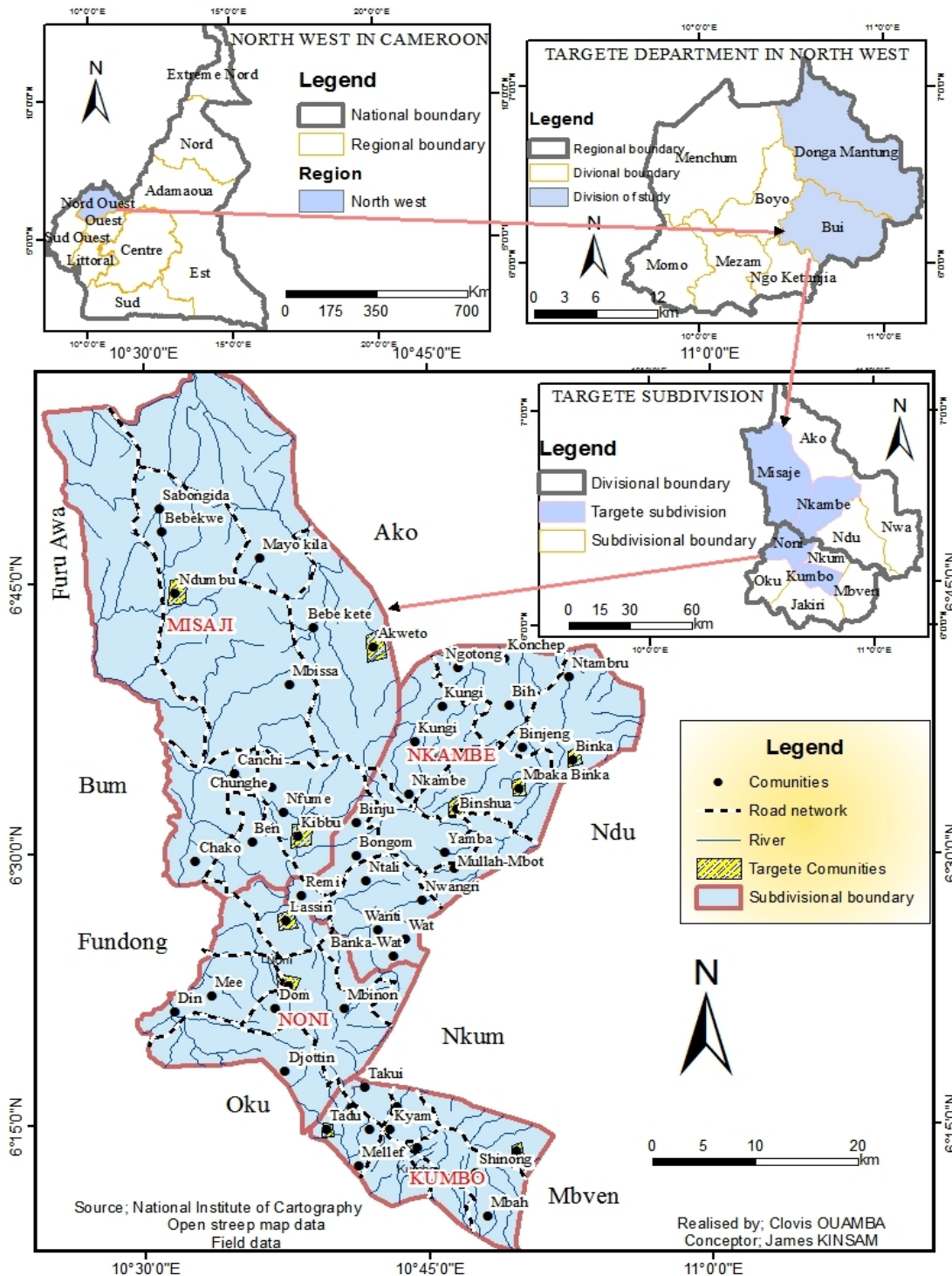


Fig 1: Location of the study area

This area is also home to many rivers amongst which are the Mbeim, (the largest river taking its rise from the Ngonzen Hills), Mee, Chau-Chau, Kibanya, and Kiawah, which flows through Awi and Eleh and empties into River Kimbi passing through Misaje Sub Division. These rivers are being used by both land users for various purposes though some are gradually becoming streams due to encroachment on forestland by both crop farmers and grazers in search of farms and grazing land respectively.

1.1.2. Methods: Bui and Donga Mantung Division have a long history of crop farmer-grazer conflict. Of the eleven Subdivisions that make up the study area, four Subdivisions were purposively selected (Noni, Kumbo central, Misaje and Nkambe Central Sub Division). To each sub division, three crop farming and grazing villages were purposively selected based on the recent reports on the crop farmer-grazer conflicts as well as the involvement of this communities in both grazing and crop farming activities. This led to the randomly selection of 17 crop farmers and 08 graziers per village which gives a total of 200 crop farmers and 100 graziers that make up the sample size (300) of the study. Opened and close questionnaires were design and randomly administered to the stakes of the four subdivisions. Focus group discussions with the herders, crop farmers, cattle owners, traditional chiefs, individuals, representatives of agricultural and livestock in the various ministries alongside the leaders of the Fulani communities were not left out. The obtained data from closed questionnaires were analysed using statistical tools as Microsoft Excel spread sheets while the open questions were sorted manually and interpreted. An open source GIS (QGIS 2.18) was also used with the aid of a cartographer to designed the locational map (figure 1) of the study area.

II. RESULTS AND DISCUSIONS

2.1. Typology of grazing and farming systems

Grazing and crop farming are complementary livelihoods activities practice in Bui and Donga Mantung Division in varying categories (table 1).

Table 1: Respondents grazing and farming systems

Grazing Systems	Percentages
Extensive	91.6
Intensive	8.4
Farming Systems	
Home gaderning	3.9
Permanent cultivation	89.7
Shifting cultivation	2.1
Bush fallowing	4.3

From table 1, two types of grazing systems were identified; extensive and intensive grazing system. Households' respondents revealed that the majority of the grazers (91.6%) practice extensive (free-range) system of

grazing. Cattle move freely accompanied by young herders in both the hills and the valleys during the day and are allowed to graze on their own at night. The predominant use of this system can be infer to inadequate financial means and human skills to adapt to the modern methods of cattle rearing amongst which are the establishment of cattle ranches. To some, the practice of extensive grazing system is an intimate part of their culture as they dislike seeing cattle being confined in a limited grazing space while others concur that the practice of extensive grazing is as a result of extensive lands and the absence clear demarcation of grazing land between one rearer and the other. Weather elements characterized by prolonged dry periods and sporadic and unreliable rainfall have only come to exacerbate as pasture lands and water points increasingly becomes sporadic, hence causing long distance cattle mobility, a process locally known as *fadama* in fulfude.

Besidethe overwhelm practicing of extensive grazing, a very insignificant proportion of the households (8.4%) practices intensive system of cattle rearing. Cattle are keep alternately in ranches cropped with improve pasture and only temporally sendout during the driest period of the year when almost all the pastures in their confinement are exhausted. This system is divided into two main sub systems viz; intensive and semi intensive grazing.

Intensive grazing system (zero grazing) is the case with dairy farmers. Here, cattle are stolk fed with processed feed mainly for the production of milk for instance, the case of the Tadu cattle Ranch in Kumbo Central Sub Division. Likewise, semi intensive grazing is carried out alternately where animals are stolk feed and at the same time allowed to graze on the immediate available pasture all year round like the case of the Dumbo cattle ranch. The significant proprtoin of the households practicing extensive rearing is inline with the findings of [9] who affirm that the grass field is one of the major livestock producing areas in Cameroon with over 90% of cattle in the hands of the pastoral Fulbe carried out in an extensive manner.

With regard to the farming systems practicedin the study area, four main types were identified viz; shifting cultivation (2.1%), bush fallowing (4.3%), permanent cultivation (89.7%) and home gardening (3.9%). The significant high proportion of household engaging on permanent cultivation can be infere to limited land available for crop farming caused by increase in both human and cattle population. Further in depth discussions with the resource person's deed revealed that the sedenterisation of rearers and the increasing animal distructions on crops have caused crop farmers to resort to permanent farm parcels around homes. While the low proportion of crop famers involved in shifting cultivation (2.1) is as result of increasing human pressure on the fixed piece of land and the increase application of farm imputs.

2.2. Preferred size of Herds owned and controlled by households

Cattle rearing is a noble tradition and a way of life particularly for the Fulani and Foulbé tribesmen who make up the majority of the grazers in the country [10]. Field results revealed that slightly more than half (54%) of the grazing household sampled does not agree with the keeping of large herds. This is because large herd's sizes are difficult to be contained in a single paddock while during free grazing; they easily go out of control and resort to stray damages. About 46% of the grazers keep large herds of cattle (photo 1). To this, respondents believe that entitle to a large herd of cattle is

a source of prestige and warrant respect from the society. Equally, a large cattle herd is seen as wealth while those with small or no herds are considered in the grazing community as the have not. [11] noted that, culturally, ownership of cattle amongst Fulani pastoralist is a symbol of social status in the society. The greater the number of cattle owned, the higher the social status of an individual in a Fulani society. The availability of an extensive grazing land in some areas, with large expanses of unfarmed lands of savannah grassland makes them very attractive to grazers even though grazing lands are on the decrease because of both increases in the cattle and human population.



Photo 1: A Fulani settlement at Awi (Noni) with large herds of cattle for a single grazer

Source; Author (2018)

2.3. Effects of Grazing on Food Crop Production

The effects of grazing on food crop production are varied and have far fetching imprints and ranges from crop destruction, income fluctuations to food availability challenge.

2.3.1. Crop destruction

Albeit, livestock rears and crop farming portrays a symbiotic relationship, but the carefree attitude of the stakes have had a significant negative effects on the output. Field findings reveals that a significant percentage (88.4%) against 11.6% of the crop farmers have experienced crop damage by cattle with most of the damages reported to be intentional. Most crop damages are recorded on the "country Sunday" (traditional days in which farming is forbidden according to the laws and customs of the land) and normal Sundays as grazers take the advantage to send their cattle into farming land on grounds that no one sees or controls them. The

encroachment of crop farmers into grazing lands without cattle proof fences have also exposed their crops to damages by cattle. Table 2 shows the distribution of fallen victims to crop destruction in Bui and Donga and Mantung.

Table 2: Victims of crop destructions by cattle

Victims of crop destruction	Frequency	Percent
Fallen victims	177	88.4
Never been a victim	23	11.6
Total	200	100

While cattle's rearing seems to be carried out by the minority in the communities, it is at the same time regrettable that a handful of the inhabitants of these localities have witness crop destructions of varied nature, which have only, weaken and paralyses their coexistence and livelihoods. This significant

number (88.4%) of victims of crop destruction can be inferred to the large number of herds controlled by teenage herders as young as 10 years (plate 1). Besides the availability of projected rocks, fruit trees (guavas) have increasingly colonized both the uphill and the valleys. The presence of these food sources has derailed the attention of these young herders as they engage in playing; jumping from one rock to another while some resort to the harvesting of the guava fruits. By so doing, they

become less conscious and cattle descend to the nearby farming plots on their own and resort to crop destructions without their prior notice (plate 1, photo B). To [12], the negligence of the Fulani herdsmen to put more attention on their animals during grazing especially in the cropping season have only exposed their animals to eat and destroy the crops of their opponents.

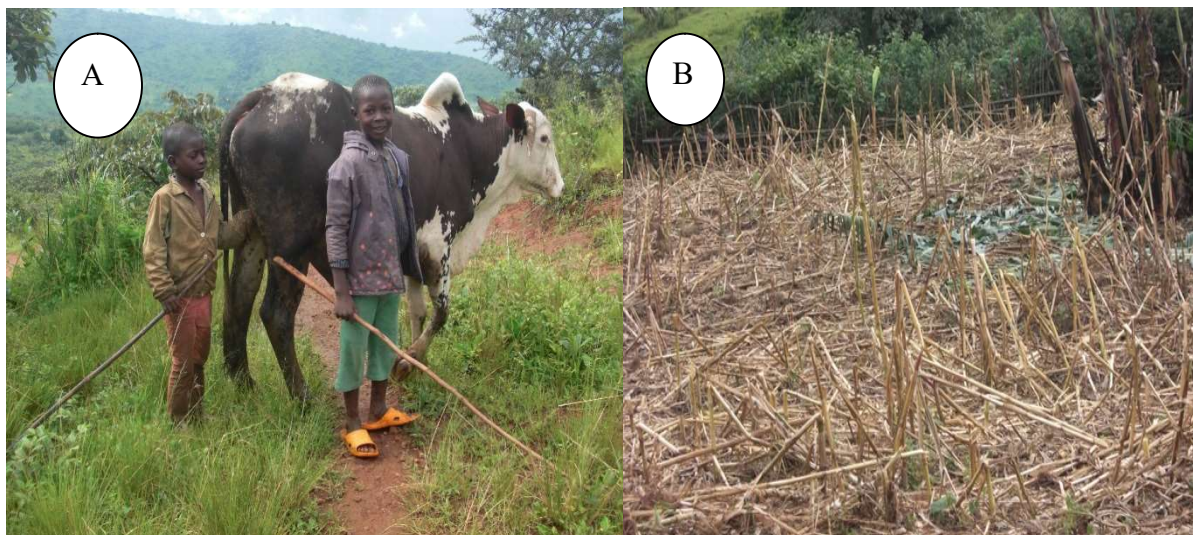


Plate 1: Photo A: Teenage herders behind cattle in Noni, Photo B: A destroyed maize farm by cattle in Vun (Noni)

Source; Author(2018)

2.3.2. Frequency of crop destruction and seasonality

Field findings revealed that the majority (37.2%) of the crop farmers are victims of crop damage between 1-5 times. This is closely followed by 6-10 times representing 36.8% with only 11.8% stating that they have not experienced crop destructions (table 3). Household respondents concur that the intensity of crop destruction is not only viewed in terms of frequency but also in terms of the farm sizes and the

quantity of crops content in the farm. Areas of relatively high frequencies of crop destruction are found in conflict hotspots zones with high land demand amongst land users. Such cases are familiar with Awi and Nkove. These have further warranted tension between the two land users, hence the abandonment of some farmlands by the desperate crop farmers. Fewer than 12% of those who are conflict free are those with farmlands in areas located further away from cattle grazing and transhumance corridors (the case of Ecumen settlement).

Table 3: Frequency of crop destruction and seasonality

Frequency of crop destruction			Seasonal variation of crop destruction		
Frequency	Number of cases	Percentage	Seasons	Frequency	Percentage
1-5 times	75	37.2%	Rainy season	146	73
6-10 times	73	36.8%	Dry season	140	20
11 and above	29	14.4%	Both dry and rainy season	14	7
Never been a victim	23	11.8%	-	-	-
Total	200	100	Total	300	100

The agricultural calendar of Cameroon in general and that of Bui and Donga Mantung in particular is based on two main seasons: the dry and the rainy seasons. The rainy season is the principal cropping season, and during this period, grazing by

nature is limited to the hills, while crop farmers and farm plots concentrate on the valleys and plains. However, because of the carefree and ill-managed attitude of the belligerent cattle, they are grazed around both in valleys and on the hills in

all the seasons. Conflicts by consequence are abounded and most frequent in the rainy season (73%). The relatively low percentage (20%) of conflict frequency in the dry season is because of farmers that have lay off their farm parcels and resort to other alternatives to avoid squabbles.

In such situations, crops such as maize alongside other undergrowth relay plants like beans and groundnuts grown mainly in the rainy season are often the targets. Plantains that thrive well in both the rainy and in the dry season in combination with market gardening crops like cabbages and tomatoes cultivated in marshy areas are the targeted crops in the dry seasons. Considering the fact that corn, yams and plantains are one of the highest produced and consumed food crops in Bui and Donga Mantung Divisions; shows the extent to which the peoples livelihood and their traditional dishes are threatened. Fewer effects are felt when cocoyams, cassava, beans and cowpea are destroyed unlike maize (corn) which is the principal food crop used for both consumption and marketing. Additionally, the dry season farming coincides with transhumance, as it is a period of scarcity of pasture for cattle. During this period, farming communities of Nkambe Central Sub Division, Tadu, Kinghomen and some parts of Noni that cultivates beans, potatoes and cowpea in the dry season have been in to conflict with the grazers as cattle often trespass into their farms, trample and/or feed on their crops.

2.3.3. Crop destruction and the state of rural economy

It is worth nothing that about 40% of Cameroonians live below the poverty level defined as US\$ 2.00 a day [13]. While majority of them depends on agriculture in general and food crop production in particular, crop destruction by cattle has been on the increase, hence adversely affecting the rural economy. The degree to which crop farming represents a share in the rural economy and its relative importance as a primary sector, determines its potential economic contribution to rural development.

Table 4 reveals that a significant proportion of crop farmers (58.1%) suffer crop destruction ranging between 100000-190000 FCFA. This is closely followed by 22.5% of crop farmers with less than 100000FCA and relatively 200000-300000 and above representing relatively 8% respectively. Those with small frequencies of crop destruction and cost is as a result of the sit and wait strategy of some crop farmers to frequently chase cattle herds trespassing on their farms during the farming seasons.

Table 4: Financial estimation of crop destruction (in francs CFA)

Cost	Frequency	Percent
Less than 100,000	51	25.3
100,000-190000	116	58.1
200,000-290,000	16	8.2
300,000 and above	17	8.4
Total	200	100

The relatively high financial loss incurred by crop farmers in this locality is a great testimonies of the extent to which crops are destroyed. The average value of the total loss incurred during the highest crop destruction is amounted to FCFA27.2 million. This represents a huge economic loss from the economy of Bui and Donga Mantung Divisions in particular, and that of the North West region of Cameroon in general. The impact of grazing practices in general and cattle in particular in the study area on crop productions lidly agrees with the findings of [14], which indicated that crop farmers incurred higher losses from conflicts that result from livestock grazing on crops.

2.3.4. Food availability and challenge after crop destruction

The immediate and long-term impact of crop destruction is the unsustain availability of foodstuffs for household's consumption. Crop destructions vary with intensities, with both minor and major cases of mass destructions. Crop farmers often suffer from food shortage in the course of the year because of their crops being destroyed by cattle. This is further aggravated in a situation whereby the crop farmer loses almost everything. These crop destructions according to households, often lead to hunger, increased poverty, squabbles, malnutrition and subsequently death as yields cultivated are only sufficient to sustain them from 3-4 months of the year. Field results revealed that a greater percentage (88.5%) of the victims of crop destruction suffers from shortage of foodstuffs to feed their families while only a less significant proportion of victims (11.2%) concur that they could still afford to provide foodstuffs for their households despite the destructions on their farmlands. This was the case of farmers with multiple farm parcels producing both for consumption and for commercial purpose. In areas where good relationships exist between the crop farmers and the grazers, some of the compensation payments of crop destruction are being offered in kind, either through the gift of salt or maize to the victims.

2.3.5. Effects of grazing on the number of cultivable farm parcels

The history of crop farming and cattle rearing atmosphere of Bui and Donga Mantung divisions reveals that crop farmers had extensive lands for farming with many farm parcel per household as well as the grazers with extensive grazing land for their cattle. This vast body of grazing and farmlands has reduced as both human and cattle population keeps increasing at the detriment of land. Crop destruction by cattle was rarely occational, except in cases of accidents hence, limited conflict outbreaks between the crop farmers and the grazers. With the decreasing available land for both food crop production and grazing, cattle crop destruction has intensified in the recent years, creating deep conflicts between the crop farmers and grazers. Consequently, this has led to the significant reduction of cultivable farmlands by many crop farmers following cases of repeated crop destruction by cattle, hence a decrease in cropping lands, increase food insecurity,

poverty and a slowdown in rural development. Field findings reveals that less than half (36.5%) of the crop farmers faces a reduction in the number of cultivable plots of farmlands (table 5). These were mainly crop farmers with repeated cases of crop destruction and those whose farm plots are dotted or besides grazing land. Such cases are familiar with Nkowe in Noni (Photo 2).

Table 5: Effects of grazing on number of cultivable farm parcels

Number of farmlands	Frequency	Percent
Reduced number of farmlands	73	36.5
Same number of farmlands	127	63.5
Total	300	100



Photo 2: Abandon farmland at Nkowe in Nkor

Source: Author (2018)

2.4. Cropfarmer's perception visavis graziers

Farmers and graziers; the two main land users in the Bui and Donga Mantung have been in a peaceful co-existence for over decades. The resulting increase in both the human and animal population has not been good news to them. These have pushed the various land users to compete for the remaining fixed land for both grazing and crop farming. This has generated conflicts amongst them and hence an atmosphere of mixed feelings against each other. When the crop farmers were asked of their perception towards the graziers, words such as: wicked people, mysterious people, jealousy, bad race, troublemakers, promoters of corruption and many others were tagged on the graziers. To this, a majority of the crop farmers (85%) against 15% described the graziers as very wicked people. This is because crop farmers consider cattle destruction as an intentional act by the graziers. Crop destruction has often been the result of diverse actions of the graziers. Voluntary destruction of fences, cattle allowed to roam freely at night, herders too young moving behind cattle during the day, and the deliberate grazing of cattle on farmlands

Furthermore, more than half (63.5%) of the crop farmers reported that despite the prevalence of grazing in their community with its attributed effects, they have observed relatively no reduction on the number of their farmlands. This was the case either with crop farmers who farm in areas further away from transhumance corridors or crop farmers who construct cattle proofences around their farm parcels.

with crops harvesting still ongoing. Some admitted that the Fulani graziers have been using very intimidating tactics (beating and threatening of some crop farmers with knives, rape and at times use of mystical means and charms), which are clear violation of both legal and customary law. Some of these graziers in areas such as Vun and Awi in Noni, Dumbo and many others are heavily armed with conventional weapons infiltrating through the porous Cameroon-Nigerian border, and constitute a threat to the lives of the crop farmers.

Note should be taken for the fact that not all graziers are being considered as a threat. Some of them (15%) are seen to be cautious about their grazing activities in the field. They assist in soil fertility improvement through the practice of alliance farming while some work in collaboration with the crop farmers to avoid conflict outbreak. This cordial relationship and understanding established by some of the graziers have gone a long way to maintain peace between the two land users.

III. CONCLUSION AND RECOMMENDATIONS

Grazing and farming systems are varied and have proven to be a challenge to livelihood sustenance. These grazing systems in one hand are both extensive and intensive while farming systems in the other hand include home gardening, bush fallowing, permanent and shifting cultivation. Agricultural land is decreasing while grazing land is increasingly colonized by obnoxious plants species. To these, frequent crop destruction has now become the norms rather than the exception. Possibility of expanding farmlands, yields and household income are becoming very slim. Households complained of inadequate land for agricultural development and preferential treatments given to graziers during moments of legal procedurs. Clear demarcation between grazing and farming lands, fair judgement and empowering the graziers with conventional skills could help control the conflicts and improve livelihoods.

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